Center Independent Research & Development: JPL IRAD

Kinetic Inductance Detector for Imaging at Millimeter Wavelengths (KID)

Completed Technology Project (2015 - 2016)

Project Introduction

Application of Kinetic Inductance Detection approach to construct sensitive, highly-multiplexed imaging detectors for millimeter wavelengths. This will enable the next generation of submillimeter/millimeter projects and missions for astrophysics and cosmology.

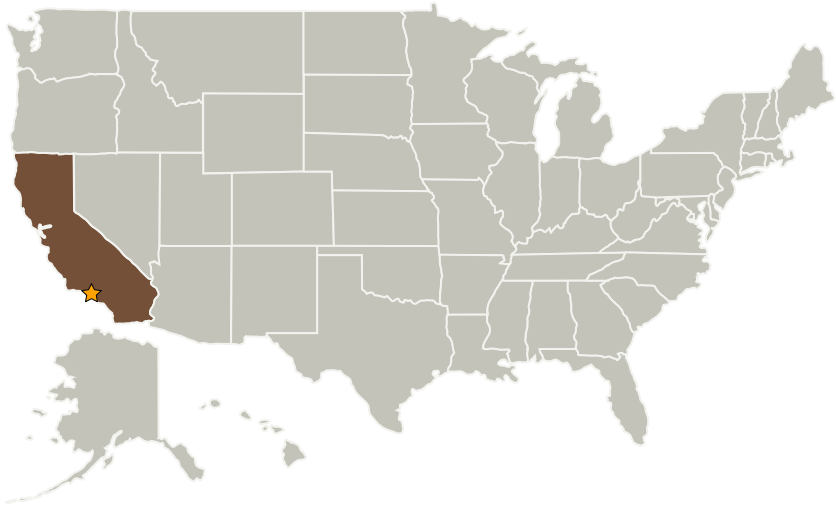
Future submillimeter/millimeter instruments for astrophysics and cosmology demand focal planes with many thousands of sensitive detectors which can be accomodated within cooling and power limits. Kinetic Inductance Detectors allow construction of such focal planes with large multiplexing factors and minimal circuitry within the cryogenic focal plane. This project investigated aluminum-based KIDs in prototype small detector arrays, confirming viability of this approach for future detector arrays.

Anticipated Benefits

The target NASA missions for the Kinetic Inductance Detectors are the Far-IR Surveyor/Origins Space Telescope and the Inflation Probe/CMBPol, as well as next-generation submillimeter and millimeter balloon-borne, airborne (SOFIA), and ground-based telescopes.

The Kinetic Inductance Detectors could also benefit ground-based submillimeter/millimeter projects funded by the National Science Foundation.

Primary U.S. Work Locations and Key Partners



JPL_IRAD_Activities Project

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Organizational Responsibility

Responsible Mission Directorate:

Mission Support Directorate (MSD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Center Independent Research & Development: JPL IRAD

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Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
California Institute of Technology(CalTech)	Supporting Organization	Academia	Pasadena, California

Primary U.S. Work Locations
California

Images

JPL_IRAD_Activities Project Image
JPL_IRAD_Activities Project
(https://techport.nasa.gov/image/26210)

Project Management

Program Manager:
Fred Y Hadaegh

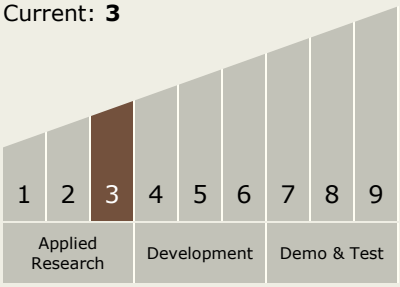
Project Manager:
Fred Y Hadaegh

Principal Investigator:
Charles D Dowell

Co-Investigators:
Roger O'brient
Jonas Zmuidzinas

Technology Maturity (TRL)

Start: **3**
Current: **3**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes